



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,955	12/18/2001	Roger Bernards	12329US02	6069
7590 06/24/2004			EXAMINER	
Jonathan R. Sick McAndrews, Held & Malloy, Ltd. 34th Floor 500 West Madison Street Chicago, IL 60661			AHMED, SHAMIM	
			ART UNIT	PAPER NUMBER
			1765	
DATE MAILED: 06/24/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/028,955	BERNARDS ET AL.	
	Examiner	Art Unit	
	Shamim Ahmed	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The declaration under 37 CFR 1.132 filed 4/13/04 is sufficient to overcome the rejection of claims 1-12 based upon Ferrier (6,162,503) even though the claims are not limited to only one topographic modifier (benzotriazole) and only one uniformity enhancer (5-aminotetrazole).

Response to Arguments

2. Applicant's arguments of any particular benefit of using the combination of a topography modifier such as benzotriazole and a uniformity enhancer such as tetrazole during the roughening process of copper surface with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Morikawa et al (6,666,987).

Morikawa et al disclose a process for roughening copper surface of a copper-clad laminate, wherein the copper surface is contacted with a liquid etchant including a

Art Unit: 1765

sulfuric acid as a pH adjuster, hydrogen peroxide, and a combination of tetrazole (5-aminotetrazole), which resembles a topography modifier and triazole (benzotriazole), which resembles an uniformity enhancer (col.2, lines 5-45,col.3, lines 9-45 and col.4, lines 21-30 and col.12, table 11).

As to claim 3, Morikawa et al disclose that the roughened copper surface is dipped in a post-dip solution after the roughening process (col.17, lines 26-30).

As to claim 10, Morikawa et al teach the use of 5-aminotetrazole in the etching composition, which reads on claimed uniformity enhancer of 5-aminotetrazole (col.4, lines 21-30).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 2,12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa et al (6,666,987) in view of Ferrier (6,162,503).

Morikawa et al discussed above in the paragraph 4 but fail to disclose a cleaning step before the roughening process.

However, Ferrier teaches the use of soak and predip prior to the use of a copper etchant solution (col.7, lines 6-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of claimed invention to modify Morikawa et al's process with the predip or a cleaning step for removing contaminants or particles in order to have a cleaned surface as taught by Ferrier.

As to claim 12, it would have been obvious to drain the cleaning solution before performing the roughening step in order to avoid cross contamination.

8. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa et al (6,666,987) in view of Adlam et al (5,861,076).

Morikawa et al discussed in the paragraph 4 above but fail to teach contacting the uniform roughened copper surface with a post-dip solution comprising an azole or silane compound or a mixture thereof.

However, Adlam et al teach the use of coupling agents for improving the bonding of roughened copper surfaces to a resinous substrate. Suitable coupling agents include

Art Unit: 1765

methylacrylamide functional amines, and titanium and zirconium containing derivatives thereof (col.9, lines 15-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of claimed invention to use silane coupling composition as taught by Adlam et al following the treatment of the copper surface with the roughening composition of Morikawa et al for providing a treated copper surface having improved adhesion characteristics.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa et al (6,666,987) in view of Adlam et al (5,861,076) as applied to claims 4-8 above, and further in view of Noddin (5,910,255).

Modified Morikawa et al discussed above in the paragraph 8 but fail to teach the post dipping solution comprises alimunate.

However, Noddin teach that the coupling agents may include silane, aluminate or zirconate (col.28, lines 47-55).

Therefore, it would have been obvious to combine the teaching of using either one of aluminate or zirconate or silane into modified Morikawa et al's composition because both the aluminate and zirconate are functional equivalent as taught by Noddin.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa et al (6,666,987) in view of Bishop et al (6,284,309).

Art Unit: 1765

Morikawa et al discussed in the paragraph 4 above but does not teach the inclusion of a copper salt in the roughening etchant composition.

However, Bishop et al teach a method for producing a copper surface with improved bonding by contacting the copper surface with a solution comprising an oxidizing agent, an acid, a copper complexing agent and a copper complex of copper salt, wherein the copper salt is present in an amount sufficient to precipitate copper from the solution for increasing the removal rate of copper (col.4, line 58-col.5, line 9).

Therefore, it would have been obvious to combine the teaching of using the copper complex of Bishop et al in to Morikawa's process for providing an improved adhesion properties of the treated copper surface by increasing the removal rate as taught by Bishop et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1765

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shamim Ahmed
Examiner
Art Unit 1765

SA
June 21, 2004